

REMARKS

Status of the Claims

Claims 1, 6, 26, 27, 29, 30, 32, 33, 35 and 45-56 are pending in this application. Claims 2-5, 7-25, 28, 31, 34 and 36-44 have been canceled. Claims 45-56 have been added. Claim 1 has been amended to incorporate the subject matter of claims 2-5. Claims 26 and 27 have been amended to delete multiple dependency. Claim 29 has been amended to recite that M¹ is a transition metal atom selected from Group 3 to Group 10. Claim 29 has also been amended to define the heteroatom. Support for amended claim 1 is found in original claims 2-5, which depended from claim 1. Support for amended claim 29 is found at page 92, lines 8-11. Applicants submit that no new matter has been added by the above claim amendments.

Election/Restriction

In view of the Examiner making the restriction final, Applicants cancel claims 7-25 and 36-44 as non-elected subject matter. The Examiner notes that reconsideration will be given to rejoin claim 35 upon the allowance of the elected claims.

Information Disclosure Statement

The Examiner objects to the IDS filed on September 26, 2001 because allegedly the foreign documents were not submitted. Applicants submit that all references listed on the PTO-1449 form were submitted to the Patent Office. However, Applicants submit a courtesy copy of each reference crossed out by the Examiner for the Examiner's convenience. Attached please find Form PTO-1449 which should be initialed and dated by the Examiner and returned to Applicants' representative.

Objection to Claims

The Examiner objects to claims 28, 29 and 32 for the phrase "n is a number satisfying a valence of M". Applicants cancel claim 28. Thus, the rejection is moot to this claim. Regarding claims 29 and 32, Applicants submit that the language is not confusing. This very phrase was acceptable in US Patent 6,309,997, claim 1, column 228, line 12. However, Applicants amend the phrase to recite that the sum of m and n is a number satisfying a valence of M. Thus, the objection should be withdrawn.

The Examiner objects to claim 31 as a substantial duplicate of claim 30. Applicants cancel claim 31; thus, the objection is

overcome. The Examiner also objects to claim 34 as a substantial duplicate of claim 32. Applicants cancel claim 34; thus, the objection is overcome.

Rejections under 35 USC §112, first paragraph

The Examiner rejects claim 29 as not enabled because the Examiner does not believe that the compounds of formula (II-b) as claimed are obtainable. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants submit that the chemical formula as recited in claim 29 is a common recitation of the chemical formula and one of ordinary skill in the art would know how to obtain the compound of claim 29 from the disclosure in the specification. Moreover, Applicants submit that this type of chemical formula is recited in U.S. Patents 6,309,997 and 6,451,728. As such, Applicants request the withdrawal of the rejection.

The Examiner also rejects claims 28 and 29 as not enabled because of the phrase "wherein M¹ is a transition metal atom selected from Group 3 to Group 11 of the periodic table". Applicants cancel claim 28; thus, the rejection is moot to this claim. Also, Applicants amend claim 29 to recite that the

transition metal atom is selected from Group 3 to Group 10 metals. As such, the rejection should be withdrawn.

Rejections under 35 USC §112, second paragraph

The Examiner rejects claims 28 and 29 as indefinite because the DFT calculation is not defined. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants cancel claim 28; thus, the rejection is moot to this claim. Regarding claim 29, Applicants submit that the DFT calculation is conducted by using a program ADF200.01, developed by SCM Co. (Netherlands). This description is disclosed at page 89, line 16 of the specification. As this is the only DFT method of calculation disclosed in the specification, Applicants submit that the subject matter of the present invention is particularly and distinctly claimed.

The Examiner rejects claims 28 and 29 as indefinite because it is allegedly not clear which heteroatom is used in the measurement. Applicants cancel claim 28; thus, the rejection is moot to this claim. Regarding claim 29, Applicants submit that the heteroatom used in measuring the distance to the β -hydrocarbon is the heteroatom which has no direct bond to the central atom M and is

nearest to the central atom M. This description is described in claim 29. As such, Applicants submit that the subject matter of the present invention is particularly and distinctly claimed and the rejection should be withdrawn.

The Examiner rejects claims 28, 29 and 32 as indefinite because of the description of the substituents as "oxygen containing group", "sulfur containing group", etc. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants cancel claim 28; thus, the rejection is moot to this claim. Regarding claims 29 and 32, Applicants submit that this claim language is acceptable as it is also recited in claim 1 of both U.S. Patents 6,309,997 and 6,451,728. However, Applicants also submit dependent claims which define the components which fall within the particular groups. As such, the rejection should be withdrawn.

The Examiner rejects claims 28 and 29 as indefinite for not defining "heteroatom". Applicants cancel claim 28; thus, the rejection is moot to this claim. Regarding claim 29, Applicants amend claim 29 to recite the specific heteroatoms. As such, the rejection should be withdrawn.

The Examiner rejects claims 30, 31 and 33 as indefinite for the terms "chlorine containing group", "bromine containing group", etc. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants submit that these terms are not indefinite. See, for example, claim 1 in both U.S. Patents 6,451,728 and 6,309,997. However, Applicants submit dependent claims to the particular compounds that fall within the groups. As such, the rejection should be withdrawn.

The Examiner rejects claim 32 as indefinite for not defining heteroatom. Applicants amend claim 32 to define heteroatom. As such, the rejection should be withdrawn.

Rejections under 35 USC. §§ 102 and 103

The Examiner rejects claims 1, 2, 3, 5 and 27 as anticipated by WO 91/12285. The Examiner rejects claims 1 and 26 as anticipated by DE 40 30 399. The Examiner rejects claims 1-3 and 6 as anticipated by USP 5,449,724 to Moffat et al. The Examiner rejects claims 1, 2 and 26 as anticipated by US Published Application 2001/0041779 to Shin et al. The Examiner rejects claims 1, 4 and 27 as anticipated by or obvious over USP 5,942,461

to Brown et al. The Examiner rejects claims 1, 2, 4 and 26 as anticipated by or obvious over USP 4,717,755 to Doi et al. The Examiner rejects claims 1, 2 and 4 as anticipated by or obvious over 5,475,067 to Schiffino. The Examiner rejects claims 1 and 26-34 as anticipated by or obvious over EP 874,005. The Examiner rejects claim 1 and 26-31 as anticipated by or obvious over EP 1,008,595. The Examiner also rejects claims 1 and 26-34 as anticipated by or obvious over JP 2000-119316.

Applicants traverse the rejections and respectfully request the withdrawal thereof. Applicants amend claim 1 to incorporate the subject matter of claims 2-5. Thus, all of the prior art rejections to the claims have been overcome by this amendment. As such, Applicants respectfully request the withdrawal of the rejections.

Conclusion

As Applicants have addressed and overcome all rejections in the Office Action, Applicants respectfully request that the rejections be withdrawn and that the claims be allowed.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kecia Reynolds (Reg. No. 47,021) at the

Appl. No. 09/937,520

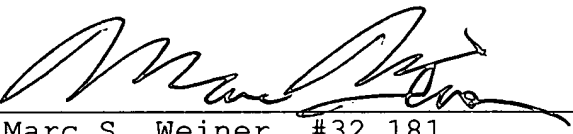
telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to the provisions of 37 C.F.R. §§ 1.17 and 1.136(a), the Applicants hereby petition for an extension of one (1) month to March 25, 2003 in which to file a reply to the Office Action. The required fee of \$110.00 is enclosed herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made
Courtesy copy of references (9)

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 2-5, 7-25, 28, 31, 34 and 36-44 have been canceled.

The claims have been amended as follows:

1. (Amended) An olefin polymer which is [a polymer of at least one olefin selected from olefins of 2 to 20 carbon atoms and] selected from the group consisting of polyethylene, high-density polyethylene, linear low-density polyethylene, polypropylene, polybutene, a copolymer of ethylene and at least one olefin selected from olefins of 3 to 20 carbon atoms, dienes and cycloolefins, and a copolymer of propylene and at least one olefin selected from olefins of 4 to 20 carbon atoms, dienes and cycloolefins, wherein said olefin polymer has a number-average molecular weight of not less than [500] 110,000 and [Mw/Mn (Mw: weight-average molecular weight, Mn: number-average molecular weight) of] the ratio of number average molecular weight and weight average molecular weight (Mw/Mn) is not more than 1.5; and

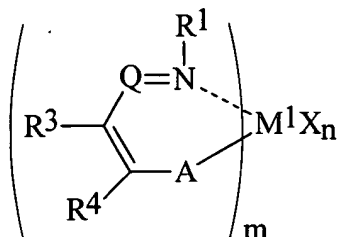
wherein said olefin polymer has a melting point of not lower than 70°C and has a racemic diad (R), as measured by ¹³C-NMR, of not less than 0.85.

26. (Twice amended) The olefin polymer as claimed in claim 1 [claims 1, 7, 10, or 16], which has a functional group at the terminal of the main chain.

27. (Twice amended) A molded product comprising the olefin polymer of claim 1 [1, 7, 10, or 16].

29. (Amended) A process for preparing an olefin polymer, comprising polymerizing an olefin of 2 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising a transition metal compound which is represented by the following formula (II-a) or (II-b) and has the following properties: (i) [that,] in a β -agostic structure of a cationic complex wherein one of X in the formula (II-a) or (II-b) is replaced with a n-propyl group, said structure being measured by a density functional method, the distance between the heteroatom, which has no direct bond to the central metal M and is nearest to the central metal M and is selected from the group consisting of halogen, nitrogen, oxygen, phosphorus, sulfur and selenium, and hydrogen at the β -position is not more than 3.0 Å; and (ii) the electrostatic energy is not more than 10 KJ/mol[, to prepare the olefin polymer of claim 1, 7, 10 or

16];

Formula [...](II-a)

wherein M¹ is a transition metal atom selected from Group 3 to Group [11] 10 of the periodic table,

m is an integer of 1 to 5[,] and the sum of m and n is a number satisfying a valence of M¹,

Q is a nitrogen atom or a carbon atom having a substituent R²,

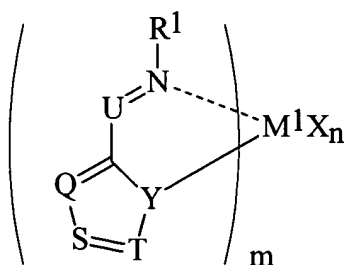
A is an oxygen atom, a sulfur atom, a selenium atom or a nitrogen atom having a substituent R⁵,

R¹ is a hydrocarbon group having one or more heteroatoms or a hydrocarbon group having one or more heteroatom-containing groups, wherein said heteroatom is selected from the group consisting of halogen, nitrogen, oxygen, phosphorus, sulfur and selenium,

R² to R⁵ may be the same or different and are each a hydrogen atom, a halogen atom, a hydrocarbon group, a hydrocarbon-substituted silyl group, an oxygen-containing group, a nitrogen-containing group, a sulfur-containing group, a boron-containing group, an aluminum-containing group, a phosphorus-containing group, a halogen

containing group, a heterocyclic compound residue, a silicon-containing group, a germanium-containing group or a tin-containing group, two or more of R^2 to R^5 may be bonded to form a ring, and when m is 2 or greater, R^1 's, R^2 's, R^3 's, R^4 's and R^5 's may be the same or different, and one group of R^2 to R^5 contained in one ligand and one group of R^2 to R^5 contained in other ligands may be bonded,

[n is a number satisfying a valence of M^1 ,] and X is an oxygen atom, a hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a nitrogen-containing group, a boron-containing group, an aluminum-containing group, a phosphorus-containing group, a halogen-containing group, a heterocyclic compound residue, a silicon-containing group, a germanium-containing group or a tin-containing group, and when n is 2 or greater, plural groups indicated by X may be the same or different, and plural groups indicated by X may be bonded to form a ring;



Formula [...] (II-b)

wherein M^1 is a transition metal atom selected from Group 3 to Group [11] 10 of the periodic table,

m is an integer of 1 to 5[,] and the sum of m and n is a number satisfying a valence of M^1 ,

Y is a nitrogen atom or a phosphorus atom,

U is a carbon atom having a substituent R^6 , a nitrogen atom or a phosphorus atom,

Q is a carbon atom having a substituent R^7 , a nitrogen atom or a phosphorus atom,

S is a carbon atom having a substituent R^8 , a nitrogen atom or a phosphorus atom,

T is a carbon atom having a substituent R^9 , a nitrogen atom or a phosphorus atom,

R^1 is a hydrocarbon group having at least one heteroatom or a hydrocarbon group having at least one heteroatom-containing group wherein said heteroatom is selected from the group consisting of halogen, nitrogen, oxygen, phosphorus, sulfur and selenium,

R^6 to R^9 may be the same or different and are each a hydrogen atom, a halogen atom, a hydrocarbon group, a hydrocarbon-substituted silyl group, an oxygen-containing group, a nitrogen-containing group, a sulfur-containing group, a boron-containing group, an

aluminum-containing group, a phosphorus-containing group, a halogen containing group, a heterocyclic compound residue, a silicon-containing group, a germanium-containing group or a tin-containing group, two or more of R^6 to R^9 may be bonded to form a ring, and when m is 2 or greater, R^1 's, R^6 's, R^7 's, R^8 's and R^9 's may be the same or different, and one group of R^6 to R^9 contained in one ligand and one group of R^6 to R^9 contained in other ligands may be bonded,

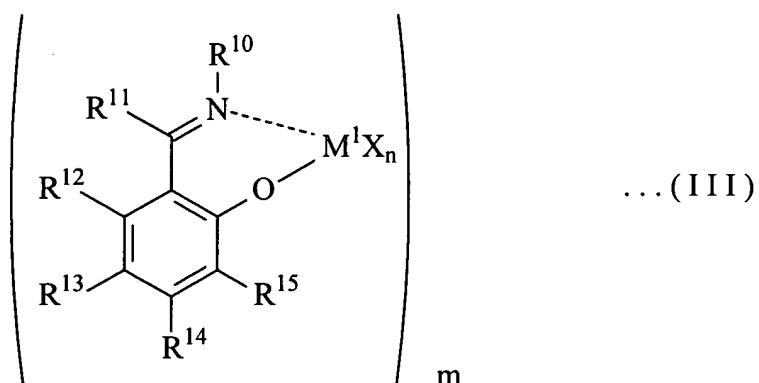
[n is a number satisfying a valence of M^1 ,] and X is an oxygen atom, a hydrogen atom, a halogen atom, a hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a nitrogen-containing group, a boron-containing group, an aluminum-containing group, a phosphorus-containing group, a halogen-containing group, a heterocyclic compound residue, a silicon-containing group, a germanium-containing group or a tin-containing group, and when n is 2 or greater, plural groups indicated by X may be the same or different, and plural groups indicated by X may be bonded to form a ring.

30. (Amended) A process for preparing an olefin polymer, comprising polymerizing an olefin of 2 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising a

transition metal compound which is represented by [the aforesaid] formula (II-a) or (II-b) in claim 29, wherein R¹ is an aromatic hydrocarbon group, an aliphatic hydrocarbon group or an alicyclic hydrocarbon group, wherein said aromatic hydrocarbon is [selected from] a phenyl group having, at [at] least one position of the 2-position and the 6-position, when the position of the carbon atom bonded to nitrogen is the 1-position, one or more substituents selected from a halogen atom and a halogen-containing group, or a phenyl group having, at [at] least one position of the 3-position, the 4-position and the 5-position, at least one substituent selected from a fluorine-containing group having one carbon atom and not more than two fluorine atoms, a fluorine-containing group having two or more carbon atoms, a chlorine atom, a bromine atom, an iodine atom, a chlorine-containing group, a bromine-containing group and an iodine-containing group, an aromatic hydrocarbon group other than a phenyl group having at least one substituent selected from a halogen atom and a halogen-containing group, an aliphatic hydrocarbon group having at least one substituent selected from a halogen atom and a halogen-containing group, or an alicyclic hydrocarbon group having at least one substituent selected from a halogen atom and a halogen-containing group[, to prepare the olefin polymer of claim 1, 7, 10

or 16].

Claim 32. (Amended) A process for preparing an olefin polymer, comprising polymerizing an olefin of 2 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising a transition metal compound which is represented by the following formula (III) [, to prepare the olefin polymer of claim 1, 7, 10 or 16];



wherein M^1 is a transition metal atom selected from Group 4 to Group 5 of the periodic table,

m is 1 or 2[,] and the sum of m and n is a number satisfying a valence of M^1 ,

R^{10} is an aromatic hydrocarbon group, an aliphatic hydrocarbon group or an alicyclic hydrocarbon group, when R^{10} is a phenyl group and the position of the carbon atom bonded to nitrogen is the 1-position, [this] the phenyl group has, at [at] least one position of

the 2-position and the 6-position, one or more substituents selected from a heteroatom and a heteroatom-containing group, or has, at [at] least one position of the 3-position, the 4-position and the 5-position, at least one substituent selected from a heteroatom selected from the group consisting of halogen, nitrogen, oxygen, phosphorus, sulfur and selenium, other than a fluorine atom, a fluorine-containing group having one carbon atom and not more than two fluorine atoms, a fluorine-containing group having two or more carbon atoms, and a group containing a heteroatom other than a fluorine atom, and when R¹⁰ is an aromatic hydrocarbon group other than a phenyl group, an aliphatic hydrocarbon group or an alicyclic group, [this] the group has at least one substituent selected from a heteroatom and a heteroatom-containing group,

R¹¹ to R¹⁴ may be the same or different and are each a hydrogen atom, a halogen atom, a halogen-containing group, a hydrocarbon group, a hydrocarbon-substituted silyl group, an oxygen-containing group, a nitrogen-containing group or a sulfur-containing group,

R¹⁵ is a halogen atom, a halogen-containing group, a hydrocarbon group or a hydrocarbon-substituted silyl group,

[n is a number satisfying a valence of M,] and

X is an oxygen atom, a hydrogen atom, a halogen atom, a

hydrocarbon group, an oxygen-containing group, a sulfur-containing group, a nitrogen-containing group, a boron-containing group, an aluminum-containing group, a phosphorus-containing group, a halogen-containing group, a heterocyclic compound residue, a silicon-containing group, a germanium-containing group or a tin-containing group, and when n is 2 or greater, plural groups indicated by X may be the same or different, and plural groups indicated by X may be bonded to form a ring.

Claims 45-56 have been added.